



## Converting heavy oil to light oil will profoundly impact oil supply

### The Family Legacy

I came from a long family line of transportation experts. My grandfather started our transportation operations in 1899 with a rented horse and wagon. His son, my father and I expanded that wagon wheel business into a nationwide surface transportation company in the United States now known as Lifschultz Fast Freight, Inc.

Over the years Lifschultz expanded into international air freight under the company Trans-Air Freight System, Inc., which was a publicly traded company on the Nasdaq. From there we moved into ocean forwarding under Wolf and Gerber and then expanded into brokerage clearing documentation. This was the beginning of one of the first integrated transportation systems for freight and brokering that included air, surface and ocean transportation in the United States.

Needless to say our family was no stranger to oil demands, oil costs and it's effect on business. Transportation profitability was primarily impacted by the price of oil and it became a factor that influenced every business in North America.

In the late 80s and early 90s we changed with the times just like the rest of the world - we jumped from transportation into technology on a much grander scale. We were interested in companies that were incubating new technologies that could have a major impact on the world economy.

As destiny would have it our transportation experience coupled with technological innovation businesses along the way had us combine those two strengths to move into what we knew would be a great entrepreneurial challenge – meeting global oil demand.

Peak oil theorist believe that world oil production will peak

and then fall - some believe that is happening right now. They have pointed out how this has happened to the world's largest producer of oil, the United States in World War II.

### **The light oil solution**

Light oil in the production of gasoline is approximately three times as efficient as heavy oil. Therefore you need to use three times the amount of heavy oil to get the same amount of gasoline. You will need three times the refinery capacity to get the same amount of gasoline as light oil. Refinery capacity is in very short supply these days. For these reasons, oil producing nations focused on light oil reserves as having the greatest value in developing gasoline, jet fuel and diesel.

As measured by proven reserves there are about 400 billion barrels of light oil in the world and it is being used at approximately the rate of 28 billion barrels a year. That means a 14 year life expectancy for light oil reserves on a realistic scale, on a generous scale light oil may only last about thirty years.

The answer to light oil shortages lies in producing more of our heavy crude oil reserves. Of the 85 million barrels a day of total oil production, about 76 million barrels of light oil are being produced, or in one year about 7% of the proven reserves. If the 900 billion barrels of heavy oil reserves were produced at the same 7% annual rate, then heavy oil production would be 171 million barrels a day, or twice our present oil demand. These numbers clearly show that the solution to the present oil crisis can be found in utilizing our heavy oil reserves.

### **Heavy Oil Consumption**

Understanding what has happened to heavy oil over the past sixty years can come from looking at the largest heavy oil discovery in the world, at Moneefa, the heavy oil field offshore Saudi Arabia. It was discovered in 1957 and has not been touched since. There are various estimates of its actual reserve size ranging from ten to forty billion barrels. Clearly with Moneefa heavy oil not yet developed we had some pertinent questions to consider. What technology could come into play that would enhance heavy oil and have the "largest" offshore heavy oil discovery come on stream? What could we do to enhance heavy oil production in Alberta? What was the solution that would set the consuming global oil world onto a new path? It took us seven years but we found the answer.

### **Converting heavy oil into light oil**

Our business minds set us out looking for a technology that could make "THE DIFFERENCE" in the oil business and could change the course of energy history. We found that technology at Genoil, Inc. Since most refineries are geared towards light oil production and heavy oil is less productive in making gasoline, it is here that the Genoil process of converting the heavy oil to light oil comes in to play.

### **The Science of converting heavy oil to light oil**

The Genoil solution addresses the heavy oil problem by using a process that will change the molecular structure of the oil: the Genoil Hydroconversion Upgrader (GHU). Oil molecules are hydrocarbons consisting of carbon and hydrogen atoms in different proportions. Heavy oils contain a relatively high proportion of (heavy) carbon atoms and light oils contain a relatively high proportion of (light) hydrogen atoms. Therefore the solution comes from a process which involves changing the chemistry of heavy oils by increasing the proportion of hydrogen atoms in the molecule, which we achieve by adding hydrogen. In addition the Genoil solution addresses Sulphur concerns by removing up to 91% of the sulfur impurities.

### **The cost of converting heavy oil to light oil**

In order to convert heavy oil to light oil Genoil has developed a Genoil Hydrogenation Upgrader. The cost of processing heavy oil into light oil using the GHU is \$14.00 a barrel. Therefore if heavy oil is currently \$60 a barrel and is processed with the GHU, it then has a total cost of \$74.00 a barrel. Clearly with the current price of oil over \$120 a barrel this provides a highly profitable margin for oil producers.